APPLICATION

FOR

UNITED STATES LETTERS PATENT

Title: **SELF-STRAIGHTENING STRAW WITH ASSURANCE THAT THE STRAW WILL BEND IN A DESIRED DIRECTION**

Inventor: **Anatoly N. KOZLOV**

ARMSTRONG, WESTERMAN & HATTORI, LLP
502 Washington Avenue, Suite 220
Towson, Maryland 21204

Telephone: 410-337-2295
Facsimile: 410-337-2296
E-mail: lbpatent@mindspring.com

BACKGROUND OF THE INVENTION

Field of the Invention.

This invention relates to drinking straws within a container or part thereof, as well as to straws inserted after the container is opened.

Description of Prior Art.

Most people like to drink through a straw because of its convenience and for sanitary reasons. Drinking through a straw helps prevent spilling and allows one to drink while walking, bicycling or driving in a car. When a straw is not provided with a plastic or glass bottle or other container, it can be frustrating and may discourage the consumer from purchasing certain beverages. Getting a straw, separately, is inconvenient. It requires taking the straw out of the wrapper; or if it was never in the wrapper to begin with, it is not sanitary. Often times, it also requires having to ask for a straw. When closing the bottle, one has to get rid of the straw; otherwise, you can't close the bottle. When you want to finish the drink later; the straw is no longer in the bottle; and this means that you have to start the search for a straw all over again or simply deal with the possible spills.

I am aware of the following prior art patents:

2,837,234
3,099,565
3,291,331
3,326,695
3,746,197
3,517,884
3,776,458
3,780,944
3,957,202
4,211,024
4,265,363
4,850,533
5,148,971
5,160,058

None of these prior art patents will guaranty that the straw will bend in a certain desired direction (or directions) or shape (or shapes) within the container, and that the straw will automatically (and always) strengthen out when the container is opened.

SUMMARY OF THE INVENTION

Accordingly, it is the primary object of the present invention to alleviate the disadvantages and deficiencies of the prior art by guaranteeing that the straw will always bend or collapse in a certain designed direction or directions within the container, and that the straw will straighten out, automatically, when the container is uncapped or otherwise opened.

The present invention is utilized with a container having a consumable liquid and further having a drinking straw housed therein, wherein the straw is in at least a partially collapsed position within the container, and wherein the straw is intended to be straightened out and to

extend above the container once the container is uncapped or otherwise opened. In the improvement of this invention, the straw has at least one corrugated section intermediately along the length of the straw. The corrugated section has a non-uniform cross-section including respective portions which are substantially diametrically opposite to one another. As a result, the straw will tend to bend in a desired direction when partially collapsed within the container, and the straw will substantially straighten out and extend above the container when the container is uncapped or otherwise opened.

In a preferred embodiment, the corrugated section of the straw includes a wall having a differential wall thickness. The wall may be either cone shaped or disk shaped, or one side of the cross-section of the straw may be provided with a stiffener. Preferably, the stiffener is hollowed out.

Preferably, the straw has two corrugated sections spaced apart from each other. One of the corrugated sections has a cross-section which is opposite to the cross-section of the other corrugated section, such that the corrugated sections of the straw tend to bend into a substantially "S" shape and direction.

In another embodiment, the corrugated section is a substantial portion of the length of the straw.

Preferably, the straw has an end portion which is anchored in a sleeve within the container.

In another aspect of the present invention, as applied to a container which has a consumable liquid and further has a drinking straw housed therein, the straw is in at least a

partially collapsed position within the container. The straw is intended to be straightened out and extends above the container once the container is uncapped or otherwise opened. The improvement comprises the straw having a corrugated section along a substantial portion of the length of the straw, the corrugated section having a non-uniform cross-section including different portions which are substantially diametrically opposite to one another and which have different wall thicknesses, respectively. The straw will also tend to bend in a desired direction when partially collapsed within the container; and such that the straw, due to its built-in resiliency, will substantially straighten out and extend above the container when the container is uncapped or otherwise opened.

Viewed in yet another aspect, the straw is in at least a partially collapsed position within the container and is intended to be straightened out to extend above the container once the container is uncapped or otherwise opened. The straw also has at least one section having a non-uniform cross-section including different portions which are substantially diametrically opposite to one another and has a built-in resiliency which will substantially straighten out to extend above the container when the container is uncapped or otherwise opened. Additionally, the straw has an end portion substantially anchored within a sleeve within the container, thereby precluding complete removal of the straw out of the container.

These and other objects of the present invention will become apparent from a reading of the following specification taken in conjunction with the enclosed drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a longitudinal sectional view of a typical container with a straw disposed in a partially collapsed state inside of the container. The straw is made with two spaced-apart reinforced corrugated sections which bend substantially into an "S" (or "Z") shape. The broken lines illustrate the extended (straightened out) position of the straw which the container is opened. The corrugations have a cone shape.

FIG. 2 corresponds to **FIG. 1**, but shows a straw having a disk-shaped corrugations.

FIG. 3 corresponds to **FIG. 1** but shows corrugations substantially along the length of the straw. The corrugations are cone shaped.

FIG. 4 corresponds to **FIG. 3**, but the corrugations are disk-shaped.

FIG. 5 is an elevational view of the straw with two spaced-apart reinforced corrugated sections having a cone-shaped design.

FIG. 6 is an elevational view of the straw with a continuous reinforced corrugated section having a disk-shaped design.

FIG. 7 is a portion of **FIG. 5**, drawn to an enlarged scale, and illustrating the disk-shaped elements comprising the reinforced corrugated sections of the straw.

FIG. 8 corresponds to **FIG. 5**, but is a rear view thereof.

FIG. 9 is a longitudinal sectional view, taken along lines 9-9 of **FIG. 8**.

FIG. 10 is a cross-section view, taken along the lines 10-10 of **FIG. 7.**

FIG. 11 is a cross-sectional view taken along the lines 11-11 of **FIG 7**.

FIG. 12 is an elevational view of the straw with two spaced-apart reinforced corrugated sections having a disk-shaped design.

FIG. 13 is an elevational view of the straw with a continuous corrugated section of disk-shaped design.

FIG. 14 is an enlarged portion of **FIG. 13.**

FIG. 15 is a cross-sectional view taken along the lines 15-15 of **FIG. 14**.

FIG. 16 is a cross-sectional view taken along the lines 16-16 of **FIG. 14**.

FIG. 17 is a cross-sectional view taken along the lines 17-17 of **FIG. 16**.

GENERAL DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to **FIG. 1** and **FIG. 2**, the straw 10 of the present invention is normally folded or collapsed in a desired shape or direction within a container 11. When the container 11 is opened, the alternate (straightened) portion of the straw is indicated by the numeral 10A. The container 11 may be made of plastic, glass or any suitable material, and the container 11 has a soft drink, milk, water, juice or other consumable liquid therein.

In **FIG. 1**, the end portion of the straw 10 is formed integrally with the container 11. The straw 10 is made as one piece with the container.

In **FIG. 2**, a sleeve 12 is integrally molded within (or otherwise suitably disposed within)

the container 11. The sleeve 12 is disposed at an acute angle with respect to the container 11, and an end 13 of the straw 10 is press-fitted or otherwise anchored within the sleeve 12.

In its folded or collapsed position within the container 11, the straw 10 has a substantially "S" (or "Z") shape.

When the container 11 is uncapped or opened (as by removing its cap 14), the straw 11 is automatically straightened out and extends beyond the container 11, as illustrated by the broken lines.

In a preferred embodiment, the straw 10 has a pair of spaced-apart corrugated sections 15 and 16, respectively.

In an alternate embodiment shown in **FIGS. 3** and **4**, the straw 10 has a continuous corrugated section 17 extending substantially along the length of the straw 10. The alternate (straightened) position of the corrugated section is indicated by the numerical 17A.

With either embodiment, the straw 10 may be provided with cone-shaped corrugations (shown at 18 in **FIGS. 5-9**) or disk shaped as at 19 in **FIGS. 12-14** and **17**, respectively.

As shown more clearly in **FIGS. 9** and **10**, the corrugated section 18 of the straw 10 has a differential wall thickness. One portion 18A is thicker than its diametrically-opposite portion 18B. As a result, the straw 10 has a built-in inherent resiliency. This spring effect assures that the straw 10 automatically (and always) straightens out when the container 11 is opened.

As shown in **FIG. 15**, one side of the straw 10 has a stiffener 20 which is essentially hollowed out, as at 21.

It is an important feature of the present invention that a differential wall thickness (e.g. **FIG. 9**) or a bridge or stiffener 20 of some form (e.g., **FIG. 15**) is provided, so that the straw 10 will always bend in a desired direction or directions or into a desired shape or shape within the container 11.

One example is **FIG. 1** wherein the spaced-apart corrugated sections 15 and 16, respectively, form an "S" (or "Z") shape or a curved shape in case of the continuous extended corrugation 19 shown in **FIGS. 3** and **4**.

When the cap 14 is removed from the container 11, the straw 10 automatically extends beyond the container 11, yet the sleeve 12 anchors the end 13 of the straw 11 and prevents complete removal of the straw 10 out of the container 11.

The approximate length of a straightened straw is a combination of the length of the largest diameter of container and height of the container. The corrugated sections in all of the straws are flexible and act like springs, that is, the spring has a built-in resiliency. Reinforcements are applied only on one side of the corrugated section while the other side is able to compress the reinforcements to insure the spring potential of the corrugated sections. The straws with two corrugations are contained in the container and kept in a S (Z or N) shaped position by the cap. The straw with at least one corrugated section which is contained within the container and kept in a flexed position by the cap. When the cap is off, the corrugated section or sections of the straw automatically straighten out. The straw automatically comes out above the rim of the container to a length about equal to largest diameter of the container. When closing the container, pressure is

applied to the top of the straw by the cap and pushes the straw back inside of the container and substantially into its original position.. The corrugated sections of the straw will bend in specific directions due to the specially designed reinforced corrugated sections.

Obviously, many modifications may be made without departing from the basic spirit of the present invention. Accordingly, it will be appreciated by those skilled in the art that within the scope of the appended claims, the invention may be practiced other than has been specifically described herein.